

# All in the Family: Parent-Child Dynamics & Weight Loss During the mFIT (Motivating Families with Interactive Technology) Study



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# Background: Obesity Prevention & Treatment

- Most U.S. adults & children not at recommendations for physical activity & healthy eating
  - Consequences including weight gain and chronic disease
- Recommendations of pediatric obesity experts:
  - Combined promotion of physical activity & healthy eating
  - Including the whole family in behavior changes



Whitlock et al. *Pediatrics* 2010; Epstein et al. *Obesity* 2010; Barlow et al. *Pediatrics* 2007.

# Background: Family Dynamics

- Parent-child communication and relationship quality
  - Predict adoption and maintenance of health behaviors in childhood
- Positive family communication
  - Higher physical activity, less sedentary time, reduced health risks
- Overall positive relationship with parents
  - Less recreational media use, higher physical activity, lower participation in risk behaviors (e.g., tobacco usage)

Ornelas et al. *IJBNPA* 2007; St. George et al. *J Ped Psych* 2013; Power et al. *Childhood Obesity* 2013; Schoffman et al. *Under review*.



# Background: Challenges

- Scalable and convenient programs for family obesity prevention have proven difficult to design/implement
- Reciprocal nature of parent-child relationship
  - Dynamic, interactive system
  - Difficult to measure
- Impact of child interactions on parent health behaviors and weight?



# Methods: mFIT Study



# Methods: mFIT Study

- 12-week remotely-delivered RCT with parent-child dyads
- Inclusion criteria:
  - Parent/Guardian:
    - insufficiently active, owns smartphone and/or tablet with data plan
  - Child:
    - aged 9-12 years
  - Both:
    - live near University of South Carolina campus
    - willing and able to be physically active
    - free of chronic disease, psychiatric disease, eating disorders, alcohol or drug dependency, or uncontrolled thyroid condition
    - not currently participating in weight loss program or taking weight loss medications



# Methods: mFIT Study

- Research question: test relationship between baseline measures of parent-child and family dynamics and weight change during the mFIT study
- **Remotely-delivered** intervention
  - **Weekly email newsletters**





# Methods: mFIT Study

- Weekly email newsletters on physical activity and healthy eating topics

## Week 9

### PARENTS:

#### TRY SOMETHING NEW

This week, we are going to focus on trying something new, whether it is a new physical activity or a new food!

**Mixing it up**

Variety is an important factor in many aspects of a healthy lifestyle, including exercise and diet. Variety in our exercise routines helps to keep our bodies "guessing," which can help us to become more fit by using new muscles or working out a different intensity level. Additionally variety in our diets helps to ensure that we are eating a range of nutrients, ensuring that we get enough of all the vitamins and minerals our body needs.

**Try something new!**

This week, we are going to focus on trying a new food and a new exercise. The catch is that you (the parent) have information in your newsletter about new vegetables and fruits to try) and your child has information about the physical activities! So, be sure the look through your section and complete the family activity together to get all the information you need...

**Foods to Try**

These are some of our favorite fruits and vegetables and some suggestions of how to prepare them:

Vegetables

- Kale- roasted and served as kale chips ([recipe](#))
- Spinach- blended in a berry smoothie
- Pumpkin- mixed in oatmeal for a healthy breakfast ([recipe](#))
- Zucchini- drizzled with olive oil and barbequed
- Sweet potatoes- sliced into wedges, drizzled with olive oil, garlic powder, and cinnamon, and grilled in wedges
- Bok choy- steamed or sautéed with sesame oil and soy sauce ([recipe](#))



Weekly goal: Try something new

Working up to healthy eating goals

Working up to 10,000 steps

Use the mFIT website



MAINTAINING A HEALTHY LIFESTYLE  
WITH INTERACTIVE TECHNOLOGY





# Methods: mFIT Study

- Research question: test relationship between baseline measures of parent-child and family dynamics and weight change during the mFIT study
- **Remotely-delivered** intervention
  - Weekly email newsletters
  - **Options for commercial apps**



# Methods: mFIT Study

- Options for commercial apps to reinforce weekly message (Android and iPhone)



# Methods: mFIT Study

- Research question: test relationship between baseline measures of parent-child and family dynamics and weight change during the mFIT study
- **Remotely-delivered** intervention
  - Weekly email newsletters
  - Options for commercial apps
  - **Pedometers**



# Methods: mFIT Study

- Pedometers, self-monitoring, goal setting, healthy rewards



# Methods: Measures

- Baseline: parents and children completed web-based questionnaires, including measures of family dynamics
- Baseline & post-program: height & weight measured by research staff



# Methods: Measures

- **Parent-child communication** (both): 5 items, e.g., “Which of the following things have you done with your parent/child in the past 4 weeks: Talked about his/her school work or grades”
- **Family engagement** (both): 6 items, e.g., “Which of the following things have you done with your parent/child in the past 4 weeks: Worked on a school project”
- **Family cohesion** (both): average of 9 items, e.g., “There is a feeling of togetherness in our family”
- **Family closeness** (both): 2 items, e.g., “How close do you feel to your parent/child?”
- **Communication with parent about eating and physical activity** (children only): average of 9 items, e.g., “When it comes to eating and physical activity: My parent listens to me”

Moos *Family Process* 1990; Williams et al. *J Person Social Psych* 1996; Pearson et al. 2006; Guilamo-Ramos et al. *AJPH* 2005; Ornelas et al. *IJBNPA* 2007.



# Methods: Analysis

- Ordinary least squares regression models:
  - Association between baseline parent-child relationship and communication and changes in BMI and BMI percentile
- Relationship quality and communication did not differ by intervention group
  - Dyads were analyzed as a single group
- Scores were dichotomized (high versus low)





# Results: Sample Description

	PARENTS (n=33)	CHILDREN (n=33)
<b>Age</b>	43±6 years	11±1 years
<b>Gender</b>	88% (n=29) female	64% (n=21) female
<b>Racial/ethnic identity</b>		
White	70% (n=23)	67% (n=22)
Black	27% (n=9)	28% (n=9)
Asian	3% (n=1)	6% (n=2)
Hispanic	6% (n=2)	9.1% (n=3)
<b>Weight status</b>	BMI: 31.1±8.3 kg/m <sup>2</sup> 15% overweight 55% obese	BMI percentile: 77.6±27.8 15% overweight 46% obese

# Results: Family Dynamics Variables

Baseline Variables	PARENTS Mean (SD)	CHILDREN Mean (SD)
Parent-child communication (0-1)	0.84 (0.21)	0.63 (0.30)
Family engagement (0-1)	0.75 (0.15)	0.68 (0.20)
Family cohesion (0-1)	0.77 (0.19)	0.72 (0.23)
Family closeness (1-5)	4.74 (0.47)	4.82 (0.39)
Parent communication about eating and physical activity (1-3)	n/a	1.93 (0.44)

# Results: Parents

high levels of engagement  
with child ( $b=-2.43$ ,  $p<0.01$ )

high perceived closeness  
to child ( $b=-2.30$ ,  $p=0.02$ )



**Change in  
BMI**

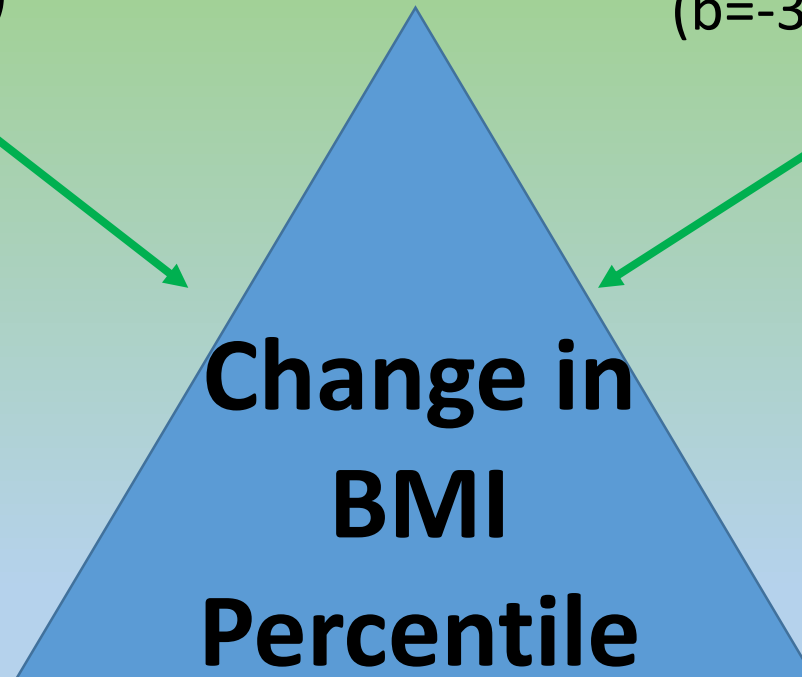
NS: family cohesion, general communication



# Results: Children

high levels of family cohesion  
( $b=-3.83$ ,  $p=0.04$ )

high levels of parent  
communication about  
eating & physical activity  
( $b=-3.83$ ,  $p=0.04$ )



NS: general communication, family engagement,  
perceived closeness to parent



# Discussion

- Parent-child relationship quality is a predictor of weight changes for parents and children
- Capitalize on the family bond in interventions to maximize weight loss and health behavior change



# Discussion: Limitations



- Small sample size
  - Limited gender and racial/ethnic diversity
- Limited tools for specific content areas



# Conclusions

- Need for more research with diverse parent/child pairings:
  - Explore different dynamics by gender, age, number of children in family
- Future research should continue to explore the **reciprocal** nature of this relationship
- Beginning of evidence for impact of parent-child relationship on parental health behaviors





# Future Research

- Currently analyzing other data from the mFIT study
  - Physical activity and dietary intake
  - Self-monitoring, goal setting, reward setting on paper vs. mobile responsive design website
  - Parent/child dyad feedback on commercial apps for physical activity and healthy eating



# Questions?



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